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ABSTRACT

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REQUIREMENTS FOR VOCABULARY DEVELOPMENT INSTRUCTION

Ann Humes

ABSTRACT

This report documents a review of the literature in the area of vocabulary development. The need for vocabulary development and the current status of vocabulary development programs are discussed. Vocabulary development is defined, and suggestions for the technology and content of a vocabulary program are delineated.

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REQUIREMENTS FOR VOCABULARY DEVELOPMENT INSTRUCTION

Ann Humes

Vocabulary is a crucial aspect of language acquisition since vocabulary knowledge is necessary for successful accomplishment of language-related activities. Analyses of the components of reading ability have indicated that knowledge of word meaning is one of the most important factors in the comprehension of reading texts. Correspondingly, knowledge of word meaning is a prerequisite for the comprehension of spoken language through listening. Furthermore, skilled writing requires a large fund of words to enable selection of the most appropriate term for expressing a desired meaning. Skilled speaking is similarly dependent on ability to use appropriate words.

Current school instruction in vocabulary appears to be haphazard, occurring incidentally when a new term is needed for a new concept and dictated by subject-area texts and curricula. Vocabulary development is too important to be left to such an unstructured approach, particularly for upper elementary school students (grades 4-8), who appear to need systematic vocabulary development independent of subject-area texts and curricula.

The factors noted above motivated SWRL's decision to investigate the area of vocabulary development. A review of the literature was undertaken. This review confirmed the importance of vocabulary development and the need for improved vocabulary development techniques. It verified the hypothesis that the current state of vocabulary instruction

is haphazard and that few acceptable instructional materials are available. The review refined further SWRL's knowledge of the vocabulary requirements of students in the 4-8 grade range and suggested psychological considerations and pedagogical approaches to accommodate these requirements.

This paper documents the findings of the literature search with regard to the need for vocabulary development, the state of vocabulary development instruction, and the definition of vocabulary development. It then discusses the suggestions for the instructional techniques and the content of a vocabulary development program. The paper finally states conclusions that may be drawn concerning the requirements of a design for a vocabulary development program.

THE NEED FOR VOCABULARY DEVELOPMENT

A growing concern over vocabulary development is reflected in research trends of the past 15 years. Research of the 1960's was principally conducted to understand acquisition of syntactic information; little attention was paid to the acquisition of semantic competence. A current greater emphasis on semantics in linguistics corresponds with a shift in emphasis to investigation of the acquisition of the semantic aspects of child language (Conference on Reading Studies 2, 1975). One of these semantic aspects is vocabulary development.

A need for improved vocabulary development programs in elementary and secondary schools is reflected in tests of college students that show their vocabulary knowledge is meager (Dale, 1965). The problem typically begins during early education because students' readers have been

lexically simplified through greater vocabulary control (Conference on Reading Studies 1, 1975; Carroll, 1969). This control limits vocabulary development because it restricts experience with many words that students will later encounter in their other reading.

Language experts charge that inadequate vocabulary development is responsible for many problems in learning: Vocabulary deficiencies affect sentence comprehension difficulty (MacGinitie, 1976), reading ability (Laird, 1970), reading achievement scores (Aulls, 1970), I.Q. results (Conference on Studies in Reading 1, 1975), reading speed (Jenkinson, 1973), and, ultimately, subject-area test scores and grades (Ayers, 1965). When students leave school, inadequate vocabulary also has a negative effect on their vocational success (Petty et al., 1967).

Explicit vocabulary instruction appears to accommodate these problems. Bradley, Cahill, and Tate (1941) investigated the effects of explicit vocabulary instruction with fifth-grade pupils and concluded that students can make "enormous gains in vocabulary acquisition by means of a sustained word study program" (p. 20). Increasing students' vocabulary ability produced a concomitant increase in verbal ability in the St. Louis Vocabulary Development Project (Draper and Moeller, 1971). Students in the fourth, fifth, and sixth grades received vocabulary instruction for three days per week. Their lessons provided a variety of experiences for each target word. Students experienced sizable gains in verbal ability as reflected in achievement tests and I.Q. measures.

These improved scores support the generally accepted opinion that vocabulary development facilitates language comprehension (Conference on Reading 1 and 10, 1975; Davis, 1972; Jenkinson, 1973; Ruddell, 1969). To understand the meaning of a sentence or a paragraph, a student must first understand the meaning of the component words. MacGinitie (1976) concluded, after his literature search, that vocabulary development and language comprehension are not separate topics, but two aspects of the same topic.

Morrison (1976) reports that the reading project staff of the University of Wisconsin Research Center believes that students' reading comprehension can be improved by teaching them to comprehend its components. After considerable research, the Wisconsin staff concluded that the components of comprehension are word meaning, sentence meaning, passage meaning, and sequencing. The Wisconsin staff further predicts that teaching the skills necessary to determine word meaning will have a direct influence on improving comprehension.

Thompson (1973) confirmed the positive effects of vocabulary teaching on comprehension. Two experimental groups in inner-city schools were administered 25 lessons designed to improve qualitative vocabulary performance, while a control group received "placebo-type" lessons. Posttesting resulted in the experimental group scoring significantly higher than the control group in both qualitative vocabulary and reading comprehension.

Marks (1976) also stresses the importance of lexical meanings, asserting that reading comprehension is a "function of the match between

the language symbols (words), experiences, and conceptual level..." (1976, p. 2). A Language for Life (1975), the report of a language inquiry committee in England chaired by Alan Bullock, lists four levels of comprehension; the lowest and thus most basic level requires knowledge of word meaning.

The above research indicates that knowledge of word meaning is important to comprehension and contributes to academic (and vocational) success. Consequently, explicit and systematic instruction for vocabulary development appears to be a beneficial method for improving students' comprehension levels and their opportunities for academic success.

THE CURRENT STATE OF VOCABULARY DEVELOPMENT TECHNOLOGY

At present, most of the valid information on vocabulary development techniques remains in the domain of research rather than application. Further, the few instructional materials that are available for vocabulary development are haphazard in organization, sequencing, and presentation, usually occurring incidentally within the study of language arts or other specific subject areas.

Block (1976) conducted an intensive survey of the literature on vocabulary development and found that research has been primarily concerned with identifying and testing words for the construction of word lists and with describing the process of word acquisition. She also concludes that little is known about the true range or limits of students' vocabulary because studies on vocabulary size have been concerned with the receptive rather than the productive modes of language.

Some of the research on vocabulary measures only the check-listing of known terms, which is a questionable practice, as Cronbach (1942) showed. He conducted a small study in his psychology class by first asking students to check the words they knew as those words are used in general psychology. Cronbach's 59 test words included one nonsense word, denomia; some students even checked it. The following day Cronbach administered an essay definition test for seven of the words on the checklist. He discovered, as he had suspected he would, that many students could not define those words they had checked on the previous day.

Petty, Herold, and Stoll (1967) postulate that teachers do not utilize the results of the relevant research that is available because communication between researchers and teachers is inadequate and because researchers often alienate teachers by ignoring factors that are important to teachers, such as motivation. When teachers do provide instruction specifically intended to increase children's vocabulary knowledge, it is frequently ineffective because the instruction is either unsystematic (Jenkinson, 1972) or the particular technique employed is based on hearsay, intuition, and tradition rather than on valid research knowledge (Holley, 1971; Petty et al., 1967).

Traditional classroom instruction generally involves a list of words that students must look up in dictionaries. They then write sentences incorporating the words, after which they are tested (Draper and Moeller, 1971). However, even this kind of vocabulary instruction can be superior to no instruction, as was demonstrated by Blair (1941). Blair investigated the list-look up technique with

beginning psychology students at the University of Illinois. One hundred and one students in the experimental group turned in lists of words they had encountered in their reading and had looked up in a dictionary. At the end of the semester, each student was matched with one of the 136 control-group students. The experimental group made significant gains in vocabulary knowledge.

A committee for the National Council of Teachers of English in its study on the state of knowledge about vocabulary and its teaching (Petty et al., 1967) agrees that teaching vocabulary has generally been accomplished through word lists; however, the committee adds that instruction has also included some limited word analysis and synthesis, some incidental teaching within the subject areas, as well as the encouragement of wide reading.

The haphazard nature of vocabulary instruction also results from a lack of competent teacher guides and good student materials. Petty et al. (1967) examined curriculum guides that noted vocabulary development as an important instructional objective. However, many of the guides provided no information on how to accomplish this objective, and others differed greatly both in their instructional suggestions and on the amount of time that should be devoted to vocabulary.

Materials and workbooks for students reflect similar inadequacies (Bernard, 1974; Winship, 1960). Commercial student materials generally consist of word lists, memory devices, and games. Any explicit instruction available is generally incorporated into language-arts workbooks and texts rather than into discrete programs (Block, 1976).

This review has established that there is currently a lack of valid and systematic instructional materials to facilitate appropriate vocabulary development. This insufficiency strongly suggests the need for a discrete, research-based program that will provide pertinent teacher information and appropriately designed and well written student materials that can be readily implemented in the classroom.

CONSTITUENTS OF THE VOCABULARY DEVELOPMENT PROCESS

Vocabulary development is defined as the process by which individuals acquire vocabulary knowledge and vocabulary usage skills. (Vocabulary development techniques are the procedures employed by instructors to facilitate their students' vocabulary development processes.) According to most authorities, important constituents of vocabulary development include the acquisition of skills that enable students (1) to decode meaning for words and groups of words and (2) to encode words into meaningful verbal communications from their knowledge of word meaning.

Decoding words involves skills in the analysis of the components of an individual word or group of words. It also entails skills in analysis of a word's environmental context for various clues to meaning which that environment may provide. The contextual environment may be heard or read; i.e., decoding occurs in the receptive modes of language.

Encoding words entails producing the applicable labels (word parts, a word, a group of words) required to translate meaning into the productive modes of language--for speaking and writing communications.

However, to encode words, a student first must have or must acquire knowledge of the meaning for which the words are labels.

Noble (1952) attempted to develop an operational definition of word meaning in terms of the mean frequency of continued written associations for a word made within a 60-second period. These written associations are similar to the "instances" that evidence mastery of a concept at the classificatory level of concept learning (Klausmeier, Ghatala, and Frayer, 1974). Many authorities agree that the process of vocabulary development is related to the process of concept development (e.g., O'Rourke, 1974; Russell, 1954), for acquisition of meaning knowledge is dependent upon the prerequisite or concurrent development of concepts and concomitant categories of concepts. O'Rourke (1974) explicitly stated that "meaningful vocabulary building is concept building" (p. 36).

The relationship between vocabulary development and acquisition of concepts is evidenced in the findings of Kessler (1974), who investigated the influence of concepts taught in science programs on the acquisition of language. She concluded that when science programs facilitate concept development, they also facilitate language development.

Carroll (1964) first described vocabulary development as concept development. He asserted that a word is a societally standardized concept: "There is some sort of reinforcing condition that brands a word as being associated with a given concept" (p. 186). Carroll sees vocabulary development as concept development via a deductive process: the concept is described verbally by a rule or definition, with the definition listing critical attributes of the concept; the

student then attains the concept by correct identification of positive and negative instances.

Klausmeier et al. (1974) state that knowing a concept's label (a word or group of words) renders that concept increasingly "facilitative" and that concepts are organized and accessed through supraordinate and subordinate classes of taxonomic systems (p. 163). These taxonomic systems are the basis for the viewpoint that vocabulary development is the acquisition of classifications of concepts, a position clearly delineated by O'Rourke (1974). O'Rourke sees vocabulary development as a system of acquisition of structures that enable learners to see words as classified components of a synergistic whole--it becomes a filing process of classifying and ordering concepts. Classification allows contexts to build up around the word. This accounts for dimensional change in an individual's definition of a word, dimensions being aspects of vocabulary development.

Research confirms the developmental change of vocabulary dimensions. Dillon (1976) concluded this from his study of semantic development (as manifest in types of definitions preferred) with groups ranging from kindergarten students to adults. He states that "meanings already acquired will continue to develop and change as various semantic features are acquired at different times" (p. 21). Relatedly, Evanechko and Maquire (1972) found a substantial change in the organization of meaning categories with increased age.

O'Rourke's (1974) view of vocabulary development as acquisition of categories of concepts was strongly influenced by Lenneberg's (1967) work on the biological foundations of language. Lenneberg felt that

"the cognitive function underlying language consists of an adaptation of a ubiquitous procers (among vertebrates) of categorization and extraction of similarities. The perception and production of language may be reduced on all levels to categorization processes, including subsuming of narrow categories under more comprehensive ones....Words label categorization processes" (p. 374). However, Lenneberg denies that words are concepts themselves: "...words are not concepts, but labels for categories" (p. 355).

Similarly Markle (1975) denies that acquisition of new words for a classification is concept learning: "Another standard technique to be eliminated from concept teaching...is definition by synonym....Much of vocabulary instruction in one's own language boils down to acquiring a new, and usually longer and more prestigious, noise to be emitted in response to a category that one has already mastered. Thus, one learns that 'to circumvent a difficulty' means to 'get around a difficulty'.... However, in the sense of having mastered a new classification scheme which was not previously in the repertoire, the learner has made no progress" (p. 6).

Whether words are labels for categories or for members of categories or are concepts themselves, organizing content by grouped terms is viable as a technique for facilitating vocabulary development because classifications provide a meaningful context in which to learn words. The importance of a meaningful presentation is confirmed by Russell (1954), who argues that learning labels depends upon the relationship between the name and the situation in which the name is presented.

Thus the authoritative consensus appears to be that vocabulary development is the process of acquiring vocabulary skills and knowledge, irretrievably intertwined with the acquisition of concepts themselves and their associated classifications.

TECHNIQUES FOR TEACHING VOCABULARY DEVELOPMENT

The instructional techniques for facilitating the process of vocabulary development should be planned and explicit according to most authorities (e.g., Ayers, 1965; Block, 1976; Petty et al., 1967). Language growth cannot be "left to chance on the principle that a 'relevant' moment will occur" (A Language for Life, 1975, p. 172).

The two major categories of instructional techniques for facilitating vocabulary development are contextual teaching and direct intervention. Both contextual and direct intervention techniques can be planned and explicit. Instruction through context involves teaching the decoding skills for analyzing a word (or group of words) within its environment to derive its meaning. Teaching students these skills is advocated by many authorities (e.g., Ames, 1966; Barbe, 1961; Block, 1976; Deighton, 1959; Durkin, 1970; Markle, 1975; Morrison, 1976; Petty et al., 1967); the necessary decoding skills should be taught so that students learn principles for application rather than discrete facts (Morrison, 1976; O'Rourke, 1974)--the instruction should focus on the skill rather than on the specific word.

Instruction through direct intervention involves teaching the encoding skills needed for generating meaningful communications.

As noted previously, checking dictionaries for definitions and then memorizing vocabulary items unfortunately is often the only technique used in direct intervention instruction. However, direct techniques may also include (1) presenting a definition for a word and providing examples of its use, and (2) presenting instruction in word parts and word groupings. These techniques can incorporate features of concept-learning methods and classification methods, for the meanings of many words may be learned through techniques like those designed to effect concept learning (Conference on Reading 2, 1975).

Students learn many concepts through direct experience with objects rather than through linguistic experience. However, a study by Johnson and O'Reilly (1964) suggests the effectiveness of providing a combination of object and linguistic cues. Johnson and O'Reilly divided their subjects, who ranged in ages from 11 to 13, into three groups. One group learned the target concept from pictures on cards. Another group learned the concept solely from verbal descriptions. A third group was presented with a combination of pictures and verbal descriptions. After learning the concept, students were asked to form a verbal definition of that concept. The combination group performed better on that task than either of the other groups did. Interestingly, the group receiving only verbal descriptions could formulate a definition more readily than the group that learned only from pictures.

While Johnson and O'Reilly found that linguistic methods for teaching concepts can aid vocabulary development, Lieberman (1967) found, conversely, that techniques for effecting vocabulary development facilitate concept development, further confirming the positive relationship

between methods for language acquisition and concept acquisition. Lieberman's subjects consisted of 42 fifth-grade pupils who were divided into two groups for 19 weeks of instruction on 40 vocabulary lessons. One group received vocabulary instruction emphasizing learning through direct experience. The other group received vocabulary instruction stressing diction, structural analysis, antonyms, synonyms, and context clues. Both groups gained significantly in reading achievement and in concept development.

Carroll (1964), Clark (1971), Klausmeier et al. (1974), Markle (1975), and Anderson (1972; with Kulhavy, 1972) are some of the researchers who explain how to use concept-learning techniques to facilitate vocabulary development. The suggested deductive procedure requires a definition emphasizing the critical attributes followed by an appropriately sequenced presentation of examples. Carroll (1964) cautions that a formal definition for a term is successful only if it correctly identifies and describes all the relevant critical attributes and communicates their proper relationships. Sequencing is another crucial consideration, and Carroll also offers some guidelines for sequencing; they pertain to the number and saliency of the attributes and the relation of negative to positive instances.

Clark (1972) provides criteria for understanding the procedures and devising the technology for concept-learning appropriate for vocabulary development. He first enumerates the differences between learning concepts in the research situation and learning them in the classroom. He then articulates the important factors to consider in teaching

concepts and delineates specific procedures for classroom implementation of concept-learning techniques.

Markle (1975) is informative while criticizing the majority of concept presentations as inadequate and inappropriate. She cautions that the "definition should bear some clear relationship to the domain of the concept, where 'domain' means the range of examples that are to be included and the limits of the domain that separate examples from non-examples...the definition must map clearly onto the domain" (p. 3). She adds this admonishment:

> A second requirement is appropriate exemplification. Complex concepts require a complex set of examples, generated according to known rules. Conceptual instruction will dip into the nonexample realm as well. (p. 3)

She further warns that problems could arise from providing faulty exemplifiers for the definition or from using excess prose and technical or overly literate terminology.

Markle (1975) also criticizes instruction that does not take into consideration important underlying classification schemes. According to O'Rourke (1974), such categorization can be applied as an operational technique that facilitates vocabulary development by classifying words in a meaningful way for presentation. For example, words with the root struct (e.g., destruct, construct, obstruct, instruct) would be grouped together for presentation to students, thus providing maximum associational learning--the relationships and structures provide meaning. The technique prescribes classifying words in different ways to illustrate meaningful relationships, e.g., organizing by morphemes, organizing by synonyms and antonyms that are more specific labels for

broader concepts (e.g., walk is the label for the concept under which saunter and stroll are subsumed).

The instructional techniques employed, whether those for skill building, concept learning, or classification learning, determinine which semantic processes are activated during the vocabulary development. Thus Block (1976) suggests that using a variety of techniques will optimize the level of competence attained, for the mixed method was most effective in the studies she analyzed. Johnson and Stratton (1966) confirmed the superiority of a mixed method in their 1966 study. None of the four individual methods for vocabulary development proved as effective as the mixed method, which combined all four individual methods.

The literature thus suggests that a variety of techniques, including those used in skill building, in concept learning, and in classification learning will best implement vocabulary development, which has been defined as the acquisition of skills and knowledge. "Variety" here implies that these techniques may be used individually, serially, or in combination, depending upon the content being taught.

CONTENT OF A VOCABULARY DEVELOPMENT PROGRAM

The literature search elicited a wide range of content suggested for incorporation into a vocabulary development program designed for explicit instruction. For purposes of discussion they are here broadly divided into suggestions on content for the acquisition of vocabulary decoding skills and for the acquisition of vocabulary knowledge, which is prerequisite to acquisition of vocabulary encoding skills.

CONTENT FOR THE AQUISITION OF VOCABULARY DECODING SKILLS

One category of content suggested for the acquisition of vocabulary decoding skills is the analysis of unfamiliar words themselves. Features of words suggested as clues to word meaning include orthography, syllabication, compounded and hyphenated forms, contractions, and singular and plural formations (Artley, 1943; Barbe, 1976). These features may help unlock word meaning so readers need not interrupt their activities to check reference sources.

Another important skill to teach in a vocabulary development program is how to determine meaning from the environmental context in which a word (or group of words) is found (Goodman, 1975). A study by Pearson and Studt (1975) suggests that by the time students have reached the third grade they can begin to determine vocabulary from context; this is more difficult for younger students. Pearson and Studt state that "given adequate syntactic and semantic rules for determining contextual constraints, one could sort out the relative influence of each of these components of linguistic context on word identification" (p. 94).

O'Rourke (1974) suggests teaching students to perceive various forms of definition, such as synonyms and antonyms, as contextual clues to word meaning. Deighton (1959) claims that context reveals meaning by definition, example, modifiers, restatement, mechanical devices, inference, parallel sentence structure, repetition of key words, connective words, and restatement. Artley (1943), one of the progenitors of the emphasis on the use of context as a clue to meaning, believes that such contextual clues should include typographical aids, structural aids (e.g., phrases and clauses), substitute words (e.g., synonyms

and antonyms), word elements, figures of speech, pictorial representations, inference, direct explanation, and subjective clues (e.g., tone, mood, intent).

The Wisconsin Design staff (Morrison, 1976) analyzed potentially useful contextual clues to meaning mentioned by "seven authorities." Staff members then developed a list of what they considered essential clues for an appropriate technique that would enable students to approach almost any contextual situation if they had received appropriate instruction in all these clues. They include explicit clues (e.g., synonym and summary), implicit clues (e.g., example and contrast), and structural clues (e.g., punctuation marks and typography).

On the basis of his review of research studies on the use of context, Aulls (1970) concluded that "...there appear to be a number of textual constraint variables in the preceding research reported that depict segments of the printed language from which the reader is likely to benefit in determining word meaning at the sentence level. Position of a word in a sentence, grammatical class of a word, and types of grammatical structures appear to operate as constraining textual segments for both mature and beginning readers" (p. 67).

Some authorities preface their support of context decoding skills by imposing conditions on the instruction. Deighton (1959) warns that the connection between an unfamiliar word and its context must be clearcut or the context reveals nothing. He adds that context reveals only one of the meanings of an unfamiliar word, that it seldom clarifies the whole meaning, and that vocabulary growth through context revelation is a gradual process.

A Werner and Kaplan study (1950) investigating the effect of varying context on the interpretation of word meaning cautions that a problem with determining word meaning through context is that the students may transfer the meaning of the word in that context to the context of a new sentence where its meaning may be different.

Petty et al. (1967) reason that perhaps context methods have yet to prove themselves totally satisfactory not because of any defect in the concept, but because contextual clues are sometimes presented superficially and because pupils are not encouraged to use their knowledge of the language for the range of discoveries that can be made.

Aulls (1970) acknowledged the conflicting attitudes over the study of context when he conducted his extensive literature review. He found experts divided into two camps and conjectures that this division may have been produced by the results of studies in which the categories of clues, the response measures, the sample populations, and the conditions for testing differed greatly.

Some experimental studies affirm the importance of contextual clues in vocabulary development. One purpose of Young's (1951) dissertation was to determine the effect of presenting words in meaningful context upon the learning of those words. 450 subjects were exposed to 210 items in context. The posttest demonstrated a "tremendous" gain between pretest and posttest for the experimental groups who were using contextual clues. The investigator concluded that the study was proof that presenting words in meaningful context is a practical technique for vocabulary building.

A seminal study by Ames (1966) analyzed clues readers use to determine meaning from context. On the basis of that study, Ames promulgates the following clues for deriving meaning from context:

Clues derived from language experience or familiar expressions
Clues utilizing modifying phrases
Clues utilizing clauses
Clues utilizing definition
Clues utilizing description
Clues provided through connected words
Clues provided by word series
Comparison or contrast clues
Synonym clues
Clues provided by the tone, setting, and mood of a selection
Referral clues
Association clues
Clues derived from the main idea and supporting details pattern of paragraph organization
Clues provided through the question and answer pattern of paragraph organization
Preposition clues
Clues utilizing non-restrictive clauses
Clues utilizing appositive phrases
Clues derived from cause and effect pattern of paragraph and sentence organization

Quealy (1969) replicated Ames' study with 445 tenth, eleventh, and twelfth-grade students. Words were simulated to provide appropriate grapheme substitutes for the real words. Quealy concluded that Ames' criteria were essentially valid for determining meaning from context; however, he advises that the form classes to which words belong be carefully considered in designing instructional materials because he found that differences in percentages of correctly identified simulated words were related to the form class of a word.

Rankin and Overholser (1969) conducted a similar study after reviewing previous context studies and selecting criteria for testing.

Using a Cloze procedure with 208 intermediate-grade students, they designed 10 items for each of 13 clue categories corresponding to those of Ames and Quealy. Results of the investigation suggested to Rankin and Overholser that intermediate-grade students can respond to many types of contextual clues, but may be less successful with aids scoring less than 50% accuracy on their tests: question and answer, comparison and contrast, main idea and supporting details, non-restrictive clauses or appositive phrases.

Wittrock, Marks, and Doctorow (1975) conducted a study with words in familiar context with 468 sixth-grade children. They concluded that children can quickly learn and retain many new, undefined vocabulary words when the words are introduced in meaningful, familiar sentences and stories.

In conclusion, if some students can retain new words learned from context as in the Wittrock et al. study (1975), many students should be able to learn the use of contextual clues to decode enough word meaning that they need not interrupt their reading to consult a reference. This conclusion is predicated on the assumption that the instruction in clue usage is well designed and implemented.

CONTENT FOR THE AQUISITION OF VOCABULARY KNOWLEDGE

Suggestions for content for the acquisition of vocabulary knowledge can be categorized under morpheme study, substitute forms of expression, and subject area vocabulary.

Morpheme Study

Many experts are enthusiastic about the vocabulary development potential of morpheme study. For purposes of this discussion, morpheme study is defined as instruction on roots, affixes, and affixation processes. Ayers (1965) maintains that morpheme study is more general in application than many other kinds of vocabulary study, so it is better suited to the needs of students with varied backgrounds and interests. The staff of the Wisconsin Design group (Morrison, 1976) concludes that the study of word parts provides an additional tool for determining word meaning. O'Rourke (1974) also finds that morpheme study gives students an effective method of attacking unfamiliar words.

Teaching morphemes additionally provides a beneficial insight into the relationship between words (Durkin, 1970; O'Rourke, 1974). Citing an unpublished study he conducted with Edgar Dale in 1964, O'Rourke (1974) asserts that learning to recognize key roots and word families derived from those roots provides a method of transferring learned concepts from one word to another. He reports that in a city-wide vocabulary program in the Columbus, Ohio, public schools, eighth-grade students successfully studied word elements presented in self-instructional books. He proposes that the study provides evidence that the systematic teaching of key roots enables students to recognize words derived from those roots, determine meaning for the roots, and combine these roots to form additional words.

Discovering the relationship between knowledge of morphemes and vocabulary competence and determining the relative influence of Latin

study on morpheme knowledge and vocabulary were the purposes of a study Carroll (1940) conducted with 180 subjects. Results indicated that Latin has no necessary effect on English vocabulary; however, he states that "...besides general ability, there is some separate entity, independent of intelligence and not affected by Latin study, but associated with morpheme-recognition ability, which is correlated positively with vocabulary" (p. 109).

Deighton (1959) advocates "practical word analysis." He warns, however, that traditional word analysis results in a single meaning for a word despite the fact that many words have several meanings. He declares that students may have difficulty deducing the meaning of the whole word with certainty if one of the morphemes has two or even three possible meanings. O'Rourke (1974) counters that the problem of meaning is no more difficult than the problem of multiple meanings for words such as bank, head, or bay, which students must learn to handle.

Thorndike (1941) also refutes Deighton by saying that multiple meanings may make an affix hard to learn, but that difficulty does not make it unimportant for learning. He adds that instruction on affixes requires teaching probabilities instead of certainties and having pupils think in terms of variables as well as constants. Thorndike asks, "...is not this right and desirable in teaching the meanings not only of suffixes but of thousands of English words? A word is a living thing. Its sound and its meaning are not qualities which it has always and everywhere, like the properties of a chemical element, but are variables determined by those who speak and hear,

write and read, and by the circumstances in which they say, hear, and see it" (p. 73). Ayers (1965) concurs, claiming that the problem can be overcome by instruction on the principles of semantic change.

Petty (1967) hypothesizes that some research studies have obtained inconclusive results because investigators make no differentiation between inflectional suffixes and derivational suffixes and between inactive suffixes and active suffixes.

Reviewing a study by Otterman (1955) revealed another possible reason for the statistically insignificant results of some studies. Otterman studied morphemes in 250 words with seventh-grade students without achieving positive results. However, the words were familiar to the students, so they were examining morphemes in words they already knew. Despite the fact that students were not taught to apply their knowledge of morphemes to new words, the test examined and purported to determine gains in the ability to interpret new words.

Perhaps the design of some unsuccessful studies does not provide for instruction that is explicit enough. The effectiveness of explicit instruction on word parts (with an experimental group) was compared with indirect discovery of the meaning of morphemes (with the control group) by Currie (1963). The experimental group scored significantly higher in the posttest.

Appropriate content for morpheme study is found in professional books and journals rather than in currently available instructional materials (Breen, 1960; Burmeister, 1976; Dale, 1965; Deighton, 1959).

Deighton proposes teaching noun suffixes and endings with a fixed and invariable meaning, prefixes with invariant meaning, high-frequency prefixes and suffixes, word prefixes and word suffixes, and useful combining forms. After an extensive and long-term study of the prefixes in the English language, Stauffer (1942) concluded that a mastery over prefixes is essential for meeting the language needs of all students and notes the prefixes that should be taught.

In conclusion, the literature suggests that morpheme study is likely to be worthwhile if the reservations noted above serve as guidelines to more effective instruction. Therefore, content of a systematic design for vocabulary development should include morpheme study.

Substitute Forms of Expression

A wide range of alternate forms of expressing meaning is recommended for instruction to promote vocabulary development. The suggested forms may be broadly classified as synonymous language, affective language, figurative language, and language with variant meaning.

Synonymous language includes synonyms and antonyms. Many language experts advocate teaching synonyms and antonyms. O'Rourke (1974) asserts that the study and use of synonyms can facilitate making fine discriminations between the meanings of words, seeing relationships

between words, and classifying concepts. He also alleges that teaching synonyms and antonyms can help students master the concept of opposites in meaning, an important part of vocabulary concept building. Klausmeier et al. (1974) maintain that presenting synonyms for a concept results in a significant amount of learning, as measured by recognition of new instances and knowledge of concept definition.

Affective language refers to language dimensions that have emotional implications. For example, connotative words are affective language. Carroll (1964) agrees that concepts may include affective components that are embodied in public concepts (words). Although understanding connotation is necessary for successful communication (Tiedt and Tiedt, 1975), relevant research is sparse. A study by DiVesta (1966) is an exception. DiVesta investigated the development of children's affective meaning systems since results of previous studies implied that attributes which have connotative meaning in adult usage may be confused by children. Observing children in grades 2-6, he found that development of connotative meaning is secured by the time the child is in the second grade, thus making instruction in connotation feasible for students beyond that grade level.

Figurative language is often cited as important content for vocabulary development (e.g., Barbe, 1961; Deighton, 1959; O'Rourke, 1974). According to Deighton, figures of speech require special attention because they are a hazard in the road of vocabulary development. Both Deighton and Artley (1943) caution that the dictionary is of little help in understanding figurative language.

Figurative language includes idioms. Idioms are common in adult vernacular; however, it is frequently assumed that idiomatic expressions are also readily understood by children (Jenkinson, 1973). Deighton (1959) confirms the importance of studying idioms since they are difficult and thus can cause misunderstanding. Edwards (1974) conducted a study with 246 eighth-grade students to investigate idiom difficulty in the reading and understanding of prose. He found a positive correlation between the incidence of idioms in test materials and the amount of difficulty experienced by the students.

Some language is confusing because it involves alternate labels for a concept or because it has alternate meanings. Words with such multiple meanings are considered important content for a vocabulary development program. Many high-frequency words are multi-meaning in character--570 words cover at least 10,000 meanings, according to Russell (1954). Watts (1944) notes the importance of multiple meaning words, exhorting that the young child may comprehend only one meaning, which may be the incorrect one for a particular context.

The Wisconsin Design staff (Morrison, 1976) counsels that learning new meanings for old words is more difficult than learning entirely new words. Multiple meaning is perceived as an especially important vocabulary problem by Cronbach (1942): "...when a word is used in two different ways, one...has two different words spelled the same way" (p. 209).

Modifying terms that vary in meaning according to the word to which they apply are confusing. For example, the modifier <u>tall</u>

has a different meaning in relation to tree from its meaning in relation to building. Carroll (1964) advises that learning relational concepts is difficult and requires careful sequencing of the instruction.

When words vary etymologically across time and dialectally in space, they become confusing for individuals not situated in that time or space. Students need to be cognizant of the possibility that alternative meaning can be created by time and space variables. Ignoring the importance of such differences is a serious oversight (Laird, 1970; Petty et al., 1967).

Many types of substitute language are proposed for explicit instruction by most language authorities (e.g., Block, 1976; Carroll, 1964; Deighton, 1959; Greene and Petty, 1971; O'Rourke, 1974; Petty et al., 1967; Tiedt and Tiedt, 1975). Since they receive such emphasis, designers of a comprehensive vocabulary development program must include the more productive forms.

Subject Area Vocabulary

Most authorities are concerned with the problem of vocabulary development in the subject areas. Knowledge of technical vocabulary is prerequisite to the comprehension of textbooks and is often the key to basic ideas in the subject (Barbe, 1961; Block, 1976; Conference on Reading Studies 5, 1975; Cronbach, 1943; Klausmeier et al., 1974; Jenkinson, 1973). Dale (1965) requests less concern over total vocabularies and more study of special vocabularies in various fields.

Expressing concern because vocabulary gains special importance beginning in about the fourth grade, Draper and Moeller (1971) contend that when students get into subject-matter texts, a limited vocabulary begins to hinder them, especially students from backgrounds that have not rewarded or encouraged verbal ability. Middle-grade reading texts continue to have narrative content and a controlled vocabulary; however, the textbooks in science, health, social studies, and mathematics become increasingly expository, using vocabulary that is progressively different from the vocabulary of the reading texts.

Studies on subject area vocabulary verify that technical language is a problem and special instruction may be beneficial. Russell (1954) found that the rate of vocabulary growth in social studies, science, and other subject areas may slow down. In the Olander and Ehmer (1971) study of mathematics vocabulary, the performance of math students in 1968 was compared with the performance of math students in 1930 for grades four, five, and six. Olander and Ehmer concluded that the 1968 pupils outscored the 1930 groups at the fourth and fifth-grade levels, but not at sixth grade. However, the list of terms tested has been analyzed, and it was discovered that the terms classed by Olander and Ehmer as "most known" today (e.g., less, equal, part, spend) are ones that are common in daily use and thus not limited to technical areas, so they are learned from general experience. Conversely, the terms that scored as least known are exclusively technical terms (e.g., subtrahend, dividend, multiplicand). This fact affirms the need for explicit instruction on specialized terms.

When Aiken (1972) reviewed studies pertaining to the effects of language on mathematics, he repeatedly found that comprehension of technical vocabulary was a significant factor. One study Aiken cites (Call and Wiggin, 1966) investigated the effects of two different methods of teaching math, one of which involved language teaching. The experimental group was taught by an English teacher with training in teaching reading but no experience in teaching math; the control group was instructed by an experienced math teacher. The major difference between the two instructional methods was that the English teacher's procedure stressed understanding the meaning of words in math problems, a procedure more closely resembling reading instruction than math instruction. The experimental group's performance was superior to the control group's performance on the criterion test in math even when initial differences in reading and math test scores were statistically controlled.

The literature confirms the significance of subject-area vocabulary as a prerequisite to further learning in the various disciplines and the importance of including explicit instruction on technical terminology in a comprehensive program for vocabulary development.

Summary

Professionals in the field of language and vocabulary acquisition have contributed more suggestions for specific content than can be detailed economically by exposition. Consequently, the content promulgated by two or more authorities is summarized in Table I below.

TABLE I

Suggestions for Vocabulary Development Program Context

Contextual clues
Compounds
Word structure
Homonyms, synonyms, antonyms
Denotation and connotation
Rhyming words
Etymology
Origins of names
Adjectives from proper nouns
Morpheme study
Pronunciation
Syllabication
Malaprops
Spoonerisms
Dictionary usage
Color words
Multiple meaning words
Contractions
Clipped words
Acronyms
Figurative language: simile, personification, metaphor, hyperbole, metonymy, synecdoche, litotes, allegory, oxymoron, analogies
Portmanteau words
Slang
Allusions
Onomatopoeia
Euphemisms
Imagery
Affective language
Capitalization
Plurals
Punctuation

CONCLUSIONS

On the basis of a review of the literature in the field of vocabulary development, it has been determined that there is a need for a well designed, discrete vocabulary development program that is not being met by currently available materials for either teachers or students. Consequently, such a vocabulary development program is now being designed.

The design of this program will provide for acquisition of vocabulary skills and knowledge through a variety of instructional techniques appropriate to the particular content. Those techniques will incorporate applicable principles of teaching decoding and encoding skills and acquiring concepts and classifications of concepts. It was not a purpose of this study to determine whether or not the classification technique for facilitating vocabulary development is concept teaching; it remains that classifying is a viable means of organizing and presenting vocabulary content in meaningful instructional segments.

It has also been determined that to produce desired improvements in vocabulary development, explicit and systematic rather than incidental instruction must be provided. The explicit instruction should encourage and enhance both the receptive and productive language modes. While specific content of the program is subject to revision on the basis of subsequent research, the general design divides the content into five sections: 1) Word Structure; 2) Vocabulary from Context; 3) Roots, Affixes, and Affixation; 4) Alternative Language; 5) Subject-Area Vocabulary. Details of the design and its appropriate implementation will be discussed in a subsequent paper.

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